

Synopsis V1.0
Single Event Transient Testing of the Agilent HCPL 6751
Optocoupler (8302401FC & 8302401FC-X03)

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I. Introduction

This study was undertaken to determine the single event transient susceptibility of the Agilent HCPL 6751 Optocoupler (8302401FC & 8302401FC-X03). The device was monitored for transient interruptions in the output signals for proton testing at University of California Crocker Nuclear Lab (UCD).

II. Devices Tested

The Agilent HCPL 6751 are quad channel, hermetically sealed optocouplers. Each channel contains a GaAsP light emitting diode that is optically coupled to an integrated high gain photon detector. The high gain output stage features an open collector output providing both lower saturation voltage and higher signaling speed than possible with conventional photo- Darlington optocouplers. The shallow depth and small junctions offered by the IC process provides better radiation immunity than conventional phototransistor optocouplers.

The sample size used during the tests was three devices. The devices were manufactured by Agilent and were characterized prior to exposure. The devices tested had a Lot Date Code of 0251. All DUTs' package markings were identical (except the "-X03" devices had an orange dot on the top) and are given in the table below:

TOP	BOTTOM
A Q0251	EL
HCPL-6751	
8302401FC	
SGP	
* 50434	

III. Test Facilities

Facility: University of California at Davis Crocker Nuclear Laboratory

Protons: 63 MeV

Flux: 1.7×10^8 to 8.0×10^9 protons/cm²/s.

IV. Test Methods

The hardware used for this testing is diagrammed in Figure 1. For the transient testing, that was done using protons (device construction prohibited transient testing with heavy ions), the pulse generator was set to a dc value (grounded) to maintain the LED in the off state. The output stage was biased at 5 volts. Two scope probes were attached to two of the output stages of the device under test (DUT) and fed into a digital scope, set to trigger on any negative going pulses that are more than 200 mV from the pull-up voltage of 5 volts. A PC using a LabView controlled GPIB is used to control the test setup and to download and store any transients captured by the digital scope.

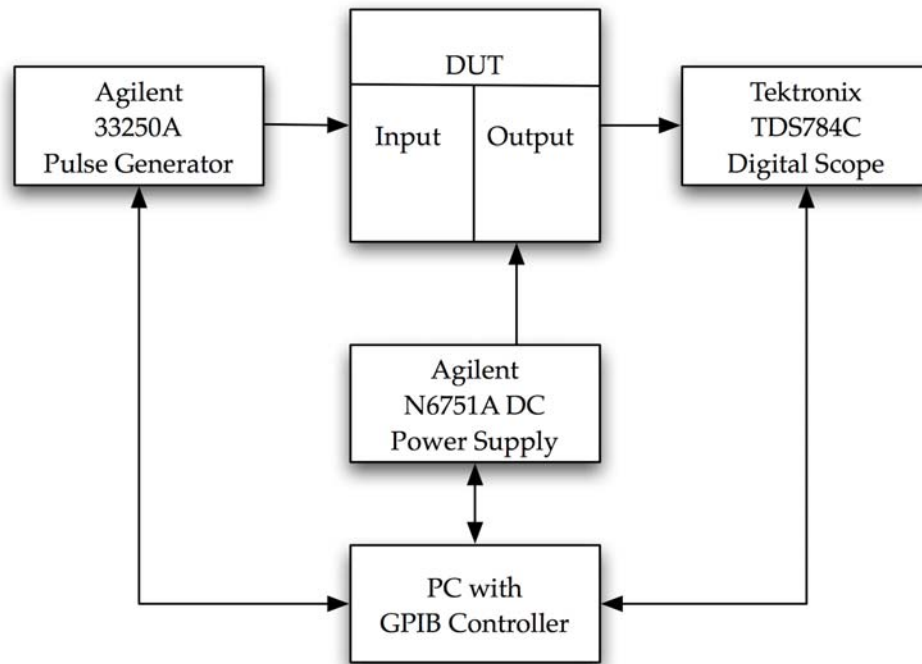


Figure 1. Test fixture block diagram

V. Results

Three parts, biased as described above, were tested with 63 MeV protons with at least 1×10^{12} protons/cm². In no test condition were any transients observed. Therefore, the Agilent HCPL 6751 Optocoupler (8302401FC & 8302401FC-X03) is not considered to be sensitive to protons for the production of transients.